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# Fax

**To:** Examiner Tuan T. Dinh**From:** Edwin W. Bacon, Jr.**Fax:****Pages:** 4


(703) 305-1341

**Phone:** (703) 306-5856**Date:** 06/21/02**Group Art Unit:** 2827**Re:** Application No. 09/928,584

See the attached in response to Office Action mailed 3/21/02.

*I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office (Fax No. (703) 305-1341) on June 21, 2002.*

Susan J. Sidwell



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#6/Response  
Kosov  
6/26/02**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Barclay, Tina  
Group Art: Unit 2827  
Examiner: Dinh, Tuan T  
Application Ser. No.: 09/928,584  
Filed: 8/13/2001  
For: **Circuit Board Assembly with Ceramic Capped Components  
and Heat Transfer Vias**

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.		
Name of Person Mailing Paper	Date	Signature
Susan J. Sidwell	6/21/02	Susan J. Sidwell

**RESPONSE TO FIRST OFFICE ACTION**

Box Non-Fee Amendment  
Commissioner For Patents  
Washington, D.C. 20231

Sir:

In response to the Office Communication mailed March 21, 2002, please consider the following.

**REMARKS**

With this paper, claims 1-10 remain pending in this application.

**Rejection Under 35 U.S.C. 103(a)**

The examiner rejected claims 1-10 as unpatentable over the arrangement shown in applicant's figure 1 (referred to by the examiner as "PA") in view of Linden et al. (Linden).

As expressly acknowledged by the examiner in the Office Action, PA does not disclose at least one cylindrical thermal via deposited into the printed circuit board (PCB) thermally connecting each pad with the heat sink. The examiner has relied on Linden to

show a PCB having thermal vias for thermally connecting a pad with a heat sink. The examiner's asserted motivation to combine PA with Linden is that it would have been obvious to one skilled in the art to use cylindrical vias to operate the ceramic device at a lower temperature.


Applicant respectfully requests that the examiner reconsider his rejection. Notwithstanding the examiner's assertion that the use of thermal vias to reduce the temperature of ceramic surface mounted components would have been obvious, applicant contends that simply reducing the temperature is not the problem solved by the applicant. The applicant has recognized that using thermal vias in conjunction with passive devices in a leadless ceramic surface mount package reduces stress in the solder joints between the package end caps and the printed circuit board. This reduced level of stress reduces the likelihood of cracks forming in the solder joints of the leadless ceramic surface mount components. The applicant does acknowledge that Linden shows thermal vias, however Linden uses the vias to reduce the temperature of the semiconductor power device associated with the vias. Neither Linden, nor the other cited references, contemplate the problem addressed by applicant, let alone the specific solution set forth in claims 1 and 10.

In support of his argument, applicant wishes to point out that the packaged component (37) of Linden has leads (not numbered). As is known in the art, the leads bend slightly and absorb dimensional differences between the component (37) and the printed circuit board (24). This slight bending of the leads reduces stress in the solder joints connecting the leads to the printed circuit board pads. The only suggested purpose of the vias is to remove heat from the component 37 (Linden, col. 10, lines 37-47.)

By comparison, an element of the applicant's invention is a surface mounted ceramic device having first and second ends with end caps. Unlike the leads shown in Linden, these end caps do not bend. But for the thermal vias of the applicant's invention, stress would accumulate in the solder joints between the end caps and the printed circuit board pads, thereby increasing the possibility of a crack forming in a solder joint. Applicant's claimed invention reduces the possibility of developing cracks in solder joints between surface mounted ceramic devices with end caps and the printed circuit board. Applicant contends this is patentably distinguishable over the asserted combination.

Accordingly, applicant believes claims 1 and 10 are now in a condition for allowance.

Applicant also notes that claims 2-9 depend either directly or indirectly from claim 1, and therefore should be allowable for the same reasons as claim 1 as discussed above.

  
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